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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/761,240

01/17/2001

Josef-Georg Bauer

GR 98 P 2124 P

5138

7590

11/19/2003

Lerner and Greenberg, P.A.  
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EXAMINER

MONDT, JOHANNES P

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary****Application No.**

09/761,240

**Applicant(s)**

BAUER ET AL.

**Examiner**

Johannes P Mondt

**Art Unit**

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 August 2003 and 22 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8/22/3.

- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The examiner has considered the item listed on the Information Disclosure Statement filed 8/22/2003.

### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Germany on 7/17/98. It is noted, however, that applicant has not filed a certified copy of the German application as required by 35 U.S.C. 119(b). Neither is there a copy of the PCT of which this application is claimed to be a continuation in the file. Applicant is requested to provide both said copies.

### ***Response to Arguments***

1. Applicant's arguments filed 8/19/2003 have been fully considered but they are not persuasive. In particular, although the examiner agrees with the argument made in favor of the interpretation of the source region as an emitter region, a region abutting the lower electrode is also an emitter region. Applicant evidently agrees with this, because in sections [0020] and [0021] regions 3 and 5 of Figure 1 in the Specification are both referred to as emitters. Furthermore, any sub-region with said region abutting said lower electrode may also be called an emitter region, because the charge carriers

can freely move within any region of any given, constant conductivity type. In this regard it is respectfully submitted that region 2, being contiguous with, - and having the same conductivity type as, region 9, qualifies as an emitter region. Finally, with regard to the traverse based on the disclosure in the specification of the limitation "a stop zone in front of the emitter for preventing passage of an electric field to said emitter region at a reverse voltage", the examiner agrees with the Applicant that said limitation is indeed disclosed, as mentioned before, to the extent that it is disclosed in Stephani et al. Examiner is puzzled how Applicant concludes from disclosure of said limitation in his own Specification that Stephani et al do not disclose the same limitation within the context of their invention. Examiner, furthermore, is unwilling to accept the interpretation "passage of an electric field": an electric field is either there or not, but is in itself not a transportable commodity. Clearly, the structural effect rather than the functional aspect has to be compared with the one found in the prior art. Admittedly, electric field values are structural once claimed in space and/or time. However, the "junction termination" taught by Stephani et al also reduces any electrostatic potential from region 2 through shielding or electrostatic screening. Therefore, the rejection of claims 1-4 under 35 U.S.C. 102(b) as being anticipated by Stephani et al stands.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1-4** are rejected under 35 U.S.C. 102(b) as being anticipated by Stephani et al (EP 0 760 528 A2). Stephani et al teach (cf. Figure 1) a power semiconductor element (see title and "Beschreibung", column 1 – column 2, line 8), comprising:

an emitter region 2;

a stop zone 4 in front of the emitter region for preventing passage of an electric field to said emitter region at a reverse voltage, said emitter and stop zone having opposite conductivity types; and

said stop zone having (foreign (claim 4)) atoms of a doping substance determining a conductivity of said stop zone (column 3, line 54 – column 4, line 3), said atoms of said doping substance having at least one energy level within the band gap of the semiconductor and at least 200 meV away from both a conduction band and valence band of the semiconductor (claim 1), namely, in the case when the emitter zone is p-type and the abutting stop zone is consequently n-type, preferred atoms include sulfur (S) (donor level: 260 meV) (claims 2 and 4) and selenium (Se) (250 meV) (claims 3-4); wherein a number of effective doping atoms generated in the stop zone changes in dependence on whether the power semiconductor element is in a blocking operation or in a conducting operation by virtue of the considerable distance between the energy levels of the doping atoms from the conduction and valence band of the silicon. Both selenium and sulfur have at least one energy level within the band gap of silicon (Si) and are spaced at least 200 meV from the conduction band and valence band (edge) of

silicon, while silicon is the semiconductor of which both regions 2 and 4 are made (claim 4).

In conclusion, then, Stephani et al anticipate claims 1-4.

### ***Conclusion***

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P Mondt whose telephone number is 703-306-0531. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 703-308-6601. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JPM

November 8, 2003

A handwritten signature in black ink, consisting of a stylized, cursive 'J' followed by a series of loops and a long, sweeping horizontal stroke.